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Supplement. This supplement contains a short habitat characterization of the study site at Banc d'Arguin, Mauritania (Text S1) and several figures. These figures include information about the size of sexual differentiation and maturity in *Loripes lucinalis* (Fig. S1), the size at first reproduction in *L. lucinalis* (Fig. S2), and the relationship between environmental factors (i.e. air temperature and precipitation), feeding mode, and variables describing the body mass and reproductive cycle of *L. lucinalis* (Fig. S3).

Text S1: Sediment characteristics of the study site

To characterize the habitat at our study site, we took 4 replicate 8 cm deep sediment cores (2 cm diam.) on 7 October 2010 for analysis of median grain size (MGS) and percentage of silt/clay (particles <63 mm). Our study site can be characterized by sediment with MGS of 51.4 mm (range 43.0 to 56.3) and with a percentage of silt/clay of 62.5% (V/V; range 57.2 to 72.7). The reported sediment characteristics at our study site are well within the range of earlier observed values for seagrass-covered intertidal sediments at Banc d'Arguin, Mauritania (van der Geest et al. 2011).

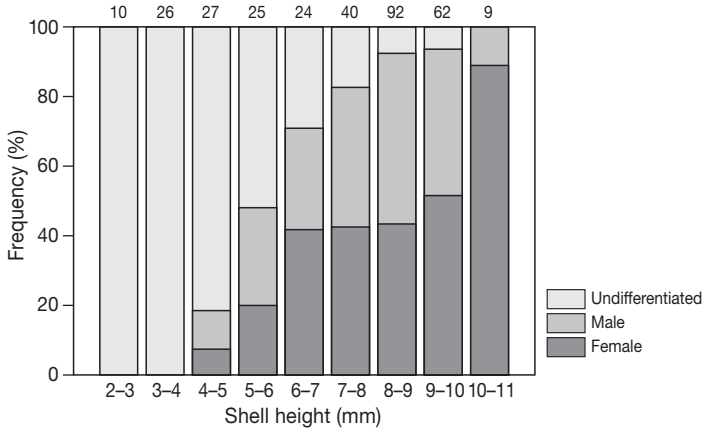

Fig. S1. *Loripes lucinalis.* Percentage of females, males and undifferentiated *L. lucinalis* per size-class (mm). Numbers above columns indicate samples sizes

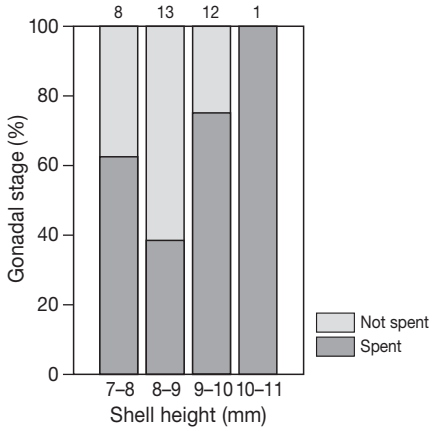

Fig. S2. *Loripes lucinalis.* Percentage of gonads in 'spent' stage per size-class (mm) for mature *L. lucinalis* (≥7 mm in shell height, see Fig. S1) collected in February and July 2010 (i.e. the months in which the 2 major spawning events occurred; see Fig. 4 in the main text). Numbers above columns indicate samples sizes

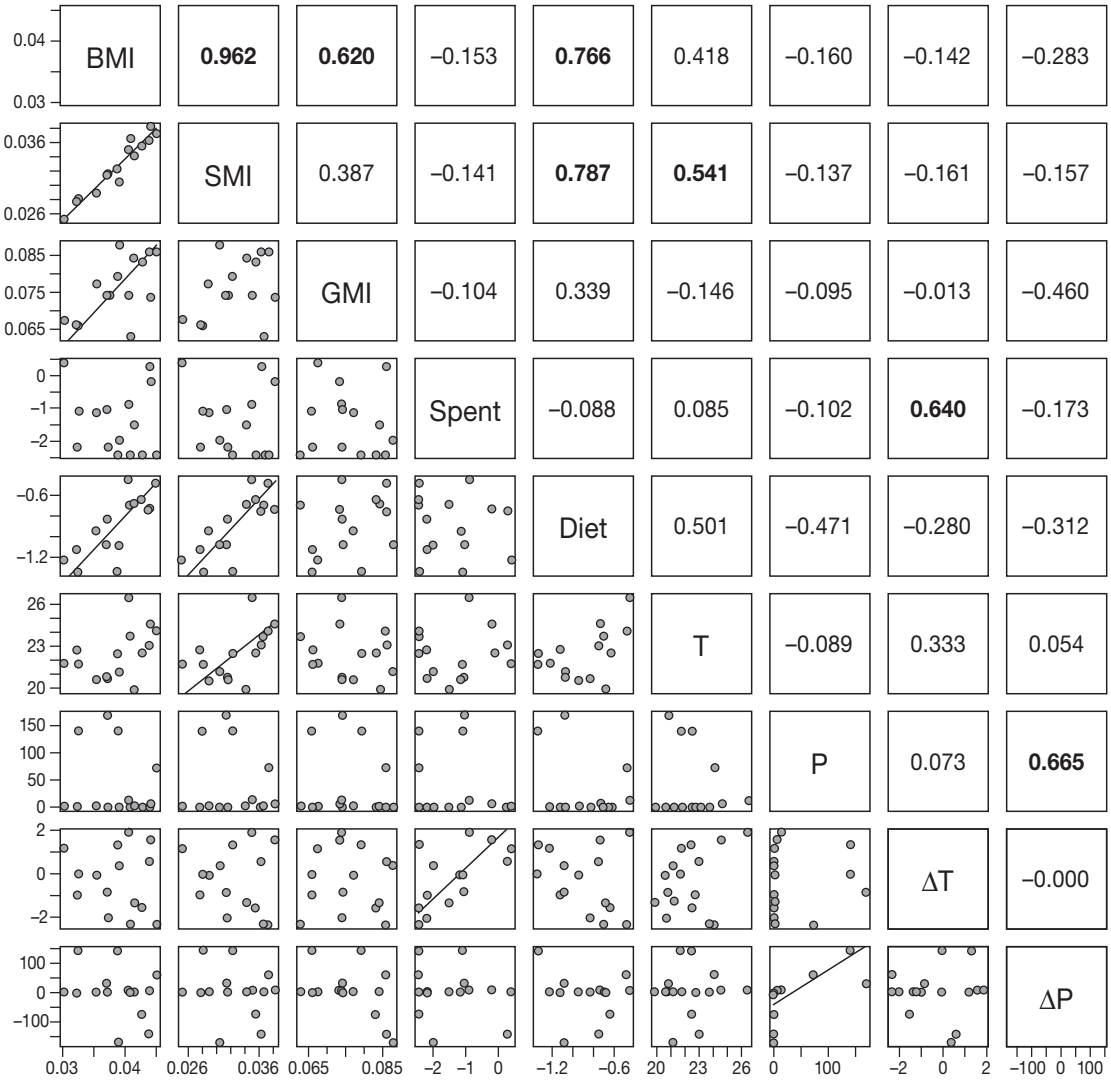

Fig. S3. *Loripes lucinalis*. Matrix of scatterplots (lower panels) and Pearson's coefficients (upper panels) of correlations between body mass index (BMI, mg cm^{-3}), somatic mass index (SMI, mg cm^{-3}), gonadal mass index (GMI, mg cm^{-3}), percentage of mature *L. lucinalis* individuals classified as 'spent' (Spent), relative heterotrophic contribution to the diet of mature individuals (Diet), air temperature (T,°C), precipitation (P, mm), and between month changes in temperature (ΔT,°C), and precipitation (ΔP, mm), respectively. Monthly mean values (n = 15) were used for all variables (note that for the plots showing between-month changes in abiotic, factors n = 14). GMI data were square-root-transformed, and data expressed in percentages (Spent and Diet) were logit-transformed to obtain normality. Significant correlations are indicated with a reduced major axis regression line through the data. Bold values represent significant correlations ($p < 0.05$)